PROJECT PROPOSAL

PARKSAVVY

INFO 3604

TABLE OF CONTENTS

Group Name **1**

Project Title **1**

Project Scope **1**

Problem Statement **1**

Project Objectives **2**

Stakeholders **2**

Project Description **2**

Methodology **2**

Project Deliverables **3**

Timeline **3**

Resources **3**

References **4**

GROUP NAME: *ParkSavvy Labs*

PROJECT TITLE: *ParkSavvy: A Smart Parking Optimization Initiative.*

PROJECT SCOPE STATEMENT:

This project is a Smart Parking System that aims to develop and implement an innovative parking solution using cutting-edge technology to optimize parking space utilization, enhance user experience and streamline the overall management of parking. This system encompasses many key features namely:

- *Software*: The development of a robust backend system and a user-friendly interface for real-time data collection, analysis, and user interaction. The interface will enable users to locate and reserve for their parking slots.
- *Database*: There must exist some database or persistent storage mechanism for storing user data and parking space information securely.
- *Testing*: All components of the system must be seamlessly integrated and comprehensive testing will be done to ensure system reliability.
- *Deployment*: A prototype will be deployed across designated parking areas and necessary training and support will be given to stakeholders.

PROBLEM/OPPORTUNITY STATEMENT:

According to the World Bank, as of 2023 nearly 56% of the world's population lives in cities. Half a century ago, a personal car was an item of luxury and status, but this has gradually changed over the years, a car is now a necessary and affordable means of transportation for many people. In recent years, the usage of vehicles has increased and is continuing to grow at a rapid rate.

Parking is a crucial component of any transportation system. The parking of vehicles grew challenging due to the urbanization and the development of infrastructure in metropolises as well as other factors. Additionally, despite the increasing number of car users, the availability of parking space isn't large enough to accommodate these vehicles. This has caused frustration, annoyance, and anxiety when it comes to finding a parking space in a public, packed area. Just recently, in the city of San Fernando at Gulf City Mall a young woman was assaulted over a parking space.

During the parking of a vehicle, people find difficulties. It takes time and increases fuel usage. It also creates added congestion and traffic. This is due to the lack of an efficient vehicle parking system.

It takes on average 4 to 14 minutes to find the expected parking. Given these factors, it is necessary to develop an efficient parking system in cities to avoid frustration, traffic, and accidents.

PROJECT OBJECTIVES:

This project aims to automate the process of finding a parking space in a public area. This system will provide a solution to the issue of finding a parking space by reducing the human work involved. It will also improve traffic flow and reduce congestion by providing drivers with parking information instantly. It will also in turn reduce the wait time to park vehicles and maximize venue availability to vehicle users.

STAKEHOLDERS:

The core users of this system are the citizens living in Trinidad and Tobago that frequent public crowded areas. This primarily includes cities where overpopulation and large personal vehicle usage takes place. This system can thus be implemented in shopping malls, restaurants, airports, and learning institutions to name a few. The non-user stakeholders of this system include the businesses or institutions connected to the parking garage who will benefit from increased patronage.

PROJECT DESCRIPTION:

This project is a Smart Parking system that is intended to efficiently manage parking space allocation and usage in Trinidad and Tobago. To do this, our app will reduce the manual work involved by storing the occupancy status of all parking spaces in a parking garage. When finding a parking slot, the user is required to select the "Find Parking" button for the specified location or venue in the app. To do this, the user must already have a verified account or profile.

From here, if all the parking spaces are occupied then a message is displayed to the user. If there are unoccupied parking spaces available, then the parking space number, floor level and section for the first available slot are displayed to the user. Then, the user is required to select this option by clicking the "Confirm Slot" button. The user is then directed to park, after the user has parked in their designated spot they are required to verify its occupancy by selecting the "Slot Occupied" button. This works when the user wants to find parking immediately or when they want to reserve a slot in advance. When the user is ready to exit the parking space, they must click the "Slot Unoccupied" button that replaced the "Slot Occupied" button when it was selected.

METHODOLOGY:

Several methodologies can be used to gather information about the time taken to find ample parking in a public area and the sentiments of respondents regarding this issue. For this project two methodologies will be used:

- *Observational Studies:* This will provide ecological validity. These will be conducted at various times of the day and the time taken by drivers to find parking spots, their behaviour while patrolling and any visible signs of frustration or satisfaction will be recorded.
- *Questionnaires and Surveys:* This will be used to collect data from individuals who frequent crowded parking areas. Both closed and open-ended questions will be used to garner qualitative and quantitative data about their sentiments. It will be used to determine the average time spent searching for a spot, the frustrations encountered as well as the overall feelings regarding parking availability.

Of course, when utilizing these methods, we will ensure that ethical and legal considerations such as informed consent, confidentiality and anonymity are strictly adhered to.

PROJECT DELIVERABLES:

This system will produce the following outcomes and deliverables:

- Presentation of Findings using visual aids.
- An Architecture Design/Class Diagram.
- A Use Case Diagram.
- A Sequence Diagram.
- A Risk Management Strategy Document.
- A User Interface Design.
- A web application for users and administration.
- Testing Plans.
- Sprint Reports.
- Trello Board Access.
- System Documentation.

TIMELINE:

This project is estimated to span 13 weeks, divided into phases for adequate analysis, design, development, testing and deployment. A tentative timeline for key milestones will be:

1. Present-Week 2: Finalize Project Idea
2. Week 2-Week 4: Gather Data, Investigate User Needs
3. Week 4-Week 5: Extract Insights, Present Findings
4. Week 5-Week 6: Design System, Model Requirements
5. Week 6-Week 8: Begin Implementation
6. Week 8: Mid-Project Presentation
7. Week 8-Week 10: Refine Implementation
8. Week 10-Week 12: Test Planning and Implementation
9. Week 12-Week 13: Deployment
10. Week 13: Final Project Presentation

RESOURCES:

For this project, certain resources and components are required:

- Web Server
- MySQL Database
- Secure Development Environment
- WiFi Modem
- Permission/Licencing for access to public parking spaces/garages

WORKS CITED

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